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Name	#	Hamza Saeed
ID	#	13804
subject	#	compiler construction
Date	#	22-6-2020

Questions:-1

Build an FA accepting the language L of strings defined over $\Sigma = \{a, b\}$ beginning with a and ending in b with same letters.

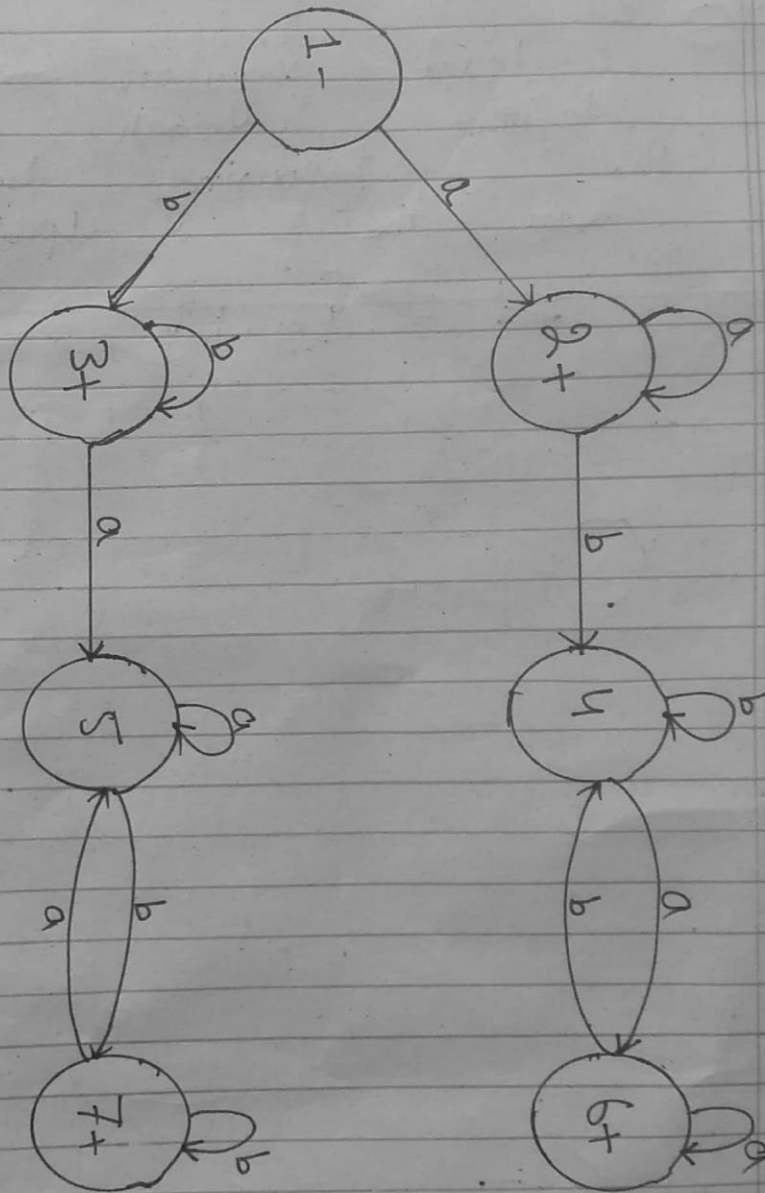
Answers:-

Solution:- The language L may be expressed by the following regular expression.

$$(a+b)^* a (a+b)^* a (a+b)^* b$$

This language L may be accepted by the following FA.

P.T. ⓐ



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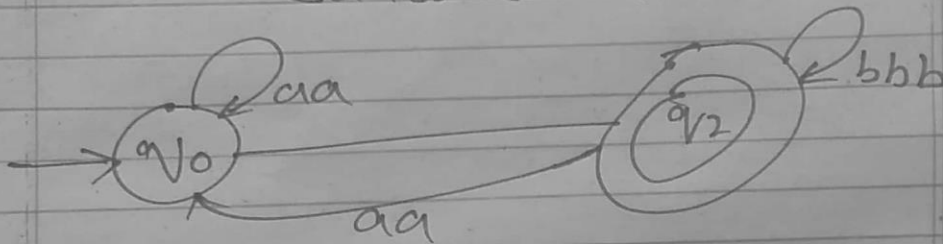
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Question :- 2

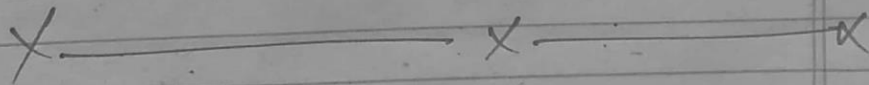
Answer :-

An FA which has
quadruple as triple

$(a+b)^* (a^2 a^2 + b^2 b^2) (a+b)^*$



Answer :-



Question # 3

Construct regular expression defining each of the following language over the alphabet $\Sigma = \{a, b\}$.

Part # a

All words having even length.

Answer: $(a+b)(a+b)^*$

Part # b

All words having at least three a and two b

Answer: $(a+b)^* (aaa)^+ (bb)^+ (a+b)^*$

Part # c

All words having at least double a or triple b.

Answers: $(a+b)^* (aa)^+ (a+b)^* + (a+b)^* (bbb)^+ (a+b)^*$

Part # d

All words start with double a or quadruple b.

Answer:-

$$aa(a+b)^* + bbbb(a+b)^*$$

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Question # 4

Distinguish between Moore and Mealy machine and convert the following Mealy machine to Moore in figure 1.

Answer:-Mealy Machine:-

A mealy machine is defined as a machine in theory of computation whose output value are determined by both its current state and current state input's. It has 6 tuples.

Moore Machine

A moore machine is defined as a machine in theory of computation whose output value are determined only by its current state. It has also 6 tuple's:

Mechanism T. Table

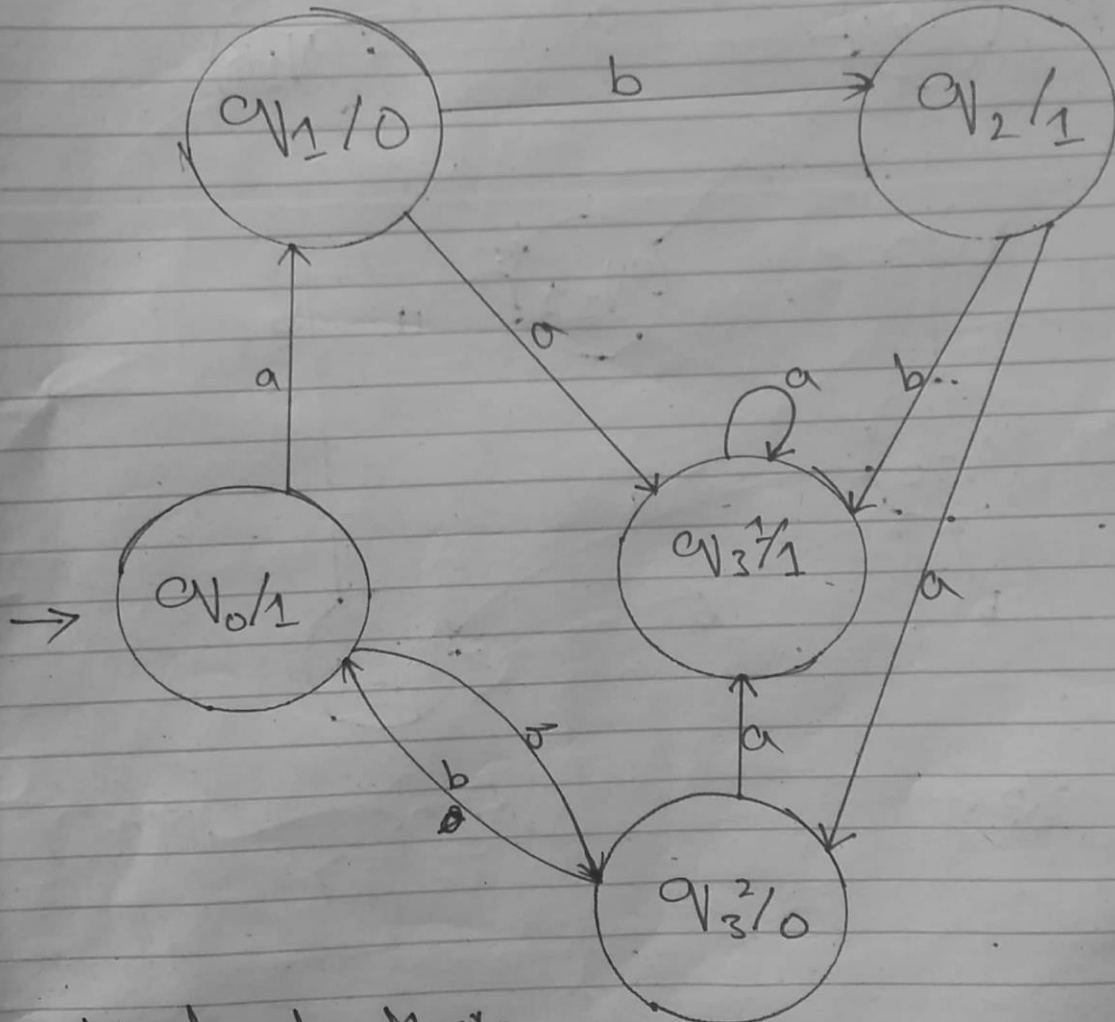
	a		b	
	state	O/P	state	O/P
q ₀	q ₁	0	q ₃	0
q ₁	q ₃	1	q ₂	1
q ₂	q ₃	0	q ₃	0
q ₃	q ₃	1	q ₀	1



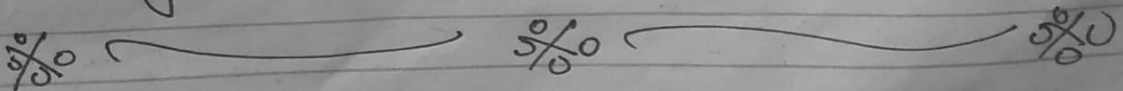
Moore Transition Table

Moore	a	b	O/P
q ₀	q ₁₀	q ₃₀	—
q ₁	q ₃₁	q ₂₁	—
q ₂	q ₃₀	q ₃₀	—
q ₃₀	q ₃₁	q ₀₁	0
q ₃₁	q ₃₁	q ₀₁	1

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Mealy to Moore conversion:



Question # 6

Draw a transition table for the diagram given in figure 2. (-) is the starting state and (+) is the ending state.

Answers:

Transition State Table:

states	a	b
1-	2	6
2	3+	X
3+	X	4
4	X	5+
5+	X	X
6	10	7
7	Y	8
8	9+	Y
9+	Y	Y
10	Y	11+
11+	Y	Y
X	X	X
Y	Y	Y

The transition table of the given figure 2.

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